

COUNTY OF SUFFOLK



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STANDARDS FOR APPROVAL OF PLANS AND CONSTRUCTION FOR SEWAGE DISPOSAL SYSTEMS FOR OTHER THAN SINGLE FAMILY RESIDENCES

APPENDIX E

SPECIFICATIONS FOR SEWER CONSTRUCTION POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

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APPENDIX E

SPECIFICATIONS FOR SEWER CONSTRUCTION POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

E1. MATERIALS

Polyvinyl Chloride Pipe and fittings used for gravity sewers shall conform to ASTM specifications D-3034. Pipe shall have SDR classification of 35. The minimum pipe stiffness at 5% deflection shall be 46 when tested in accordance with ASTM Designation D-2412. All pipe delivered to the job site shall be clearly marked at the factory with the size and class of pipe and the manufacturer's identification. Force main pipes are to be PVC class 150-SDR18 and shall conform to AWWA C-900 specifications. Fittings used for force mains shall be ductile iron pressure fittings. Where water main clearances as specified by Suffolk County Health Services Regulations cannot be maintained, SDR 25 or better PVC pipe shall be used.

E2. JOINING SYSTEM

PVC pipes and fittings shall be furnished with integral bells and spigots and rubber sealing rings. The rubber sealing rings shall meet the requirements of ASTM F-477-76. The joint design shall permit the pipe to expand, contract and deflect. The gasket shall provide an adequate compressive force against the sealing surfaces of the bell and spigot so as to effect a positive seal under all combinations of the joint tolerances. The gasket shall be the seal under all combinations of the joint tolerances. The gasket shall be the only element depended upon to make the joint flexible and water-tight. The joint shall meet the requirements of ASTM D-3212. All PVC pipe shall be installed per ASTM D-2321-74. No solvent welds will be accepted.

E3. CONNECTIONS TO STRUCTURES

Unlike with most other sewer pipe materials, concrete will not bond to PVC pipe. A seal or water-stop is required for a watertight connection between PVC pipe and concrete structures. The following alternatives are available:

- 1) Lock Joint Flexible Sleeves per ASTM C-923 can be cast into the manhole wall and the PVC pipe fastened with a stainless steel strap.
- 2) Ductile Iron Couplings can be cast directly into the manhole or manhole base.
- 3) For connections to existing manholes, a rubber ring can be stretched around the pipe and used as a water-stop when cast into the structure wall.

E4. CERTIFICATION

The pipe manufacturer shall certify that all pipe material delivered to the construction site meets or exceeds all of the requirements of ASTM Specifications D-3034 or AWWA C-900 as applicable. This shall consist of a copy of the test results that the material has been sampled, tested and inspected. Each certification so furnished shall be signed by an authorized agent of the seller or manufacturer. In addition, the contractor shall provide certification that the pipe stiffness meets or exceeds the pipe stiffness specified when tested in accordance with ASTM D-2412, that the rubber sealing ring meets ASTM F477-76 and that the joints meet ASTM D-3212.

E5. PIPE LAYING

Before joining the pipes, the joints shall be coated with a lubricant recommended by the manufacturer which shall be brushed on the surface to be coated. The spigot shall be positioned in the bell of the preceding pipe and pushed home by hand or with a metal bar. If a metal bar is used, the bell of the entering pipe shall be protected with a block of wood, to prevent damage to the pipe. The pipe layer will assure that the joint has been “pushed home”. The contractor shall utilize laser equipment for sewer line and grade.

E6. BACKFILLING AROUND PVC PIPE

The embedment material around the PVC pipe and masonry must be installed in layers not exceeding six (6) inches in accordance with the details shown on the detail sheet called PVC Sewer Foundation. The embedment material shall be Class I, Class II or Class III. Class I material shall conform to the following standard: minimum particle size 1/4 inch - maximum particle size 3/4 inch, not less than 50% by weight of material shall pass the 3/8 inch sieve. Class II material is defined as coarse sands and gravels with maximum particle size of 40mm (1 1/2 inches), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Unified soil classification Types GW, GP, SW and SP are included in this class. Class III material is defined as fine sand and clayey gravels, including fine sands, sand clay mixtures, and gravel- clay mixtures. Unified soil classification Types GM, GC, SM and SC are included in this class. All backfill material adjacent to the pipe requires hand compaction.

Each layer of Class II and Class III material shall be compacted to a minimum density of ninety-five (95) percent of maximum density of the soil as determined by the Standard Proctor Test (A.A.S.H.O. Designation T-99).

The contractor shall take care to ensure that all voids under the pipe haunch are filled and compacted and shall take precautions to prevent movement of the pipe during placing and compaction of the embedment material. No jetting will be permitted for the compaction of the embedment material.

In the event that stone backfill is used below the invert of the PVC pipe, it must be continued to the spring line of the pipe.

E7. TIMBER SHEETING AND BRACING AND STEEL SHEET PILING AND BRACING

Sheeting shall in general not be driven below the top of the embedment material (6 inches above the crown of the pipe).

If sheeting is driven below the top of the embedment material, it shall be cut at the top of the embedment material and shall be left in place.

E8. VERTICAL DEFLECTION LIMITATIONS

Testing of every section with a “Go-No Go” device is required. The total vertical wall deflection of the PVC pipes, as determined by testing not earlier than 30 days after placement and compaction of the final backfill, shall not exceed four (4) percent of the inside pipe diameter. The deflection shall be checked by manually pulling a go, no-go deflection testing mandrell through the pipe. The mandrell is shown on the Detail Sheets. If the percent of deflection exceeds the maximum specified, the contractor shall, at his own expense, undertake such remedial action as required to reduce the deflection to the limits specified. Vertical deflection tests shall be performed on all lines. The contractor shall conduct the tests under the observation of the Department of Public Works, and shall furnish all test equipment and labor for conducting the test.

E9. TESTS

All other tests, including pressure and leakage tests for force mains, and leakage and alignment tests for gravity sewers shall be performed as described in the applicable sections of the Suffolk County Sewer Agency Specifications for Sewer Construction.